

08/31/00
Jc923 U.S. PTO

09-01-00

A

EXPRESS MAIL CERTIFICATE

Date 8/31/00 Label No. 2628222539

I hereby certify that, on the date indicated above I deposited this paper or fee with the U.S. Postal Service & that it was addressed for delivery to the Assistant Commissioner for Patents, Washington, DC 20231 by "Express Mail Post Office to Addressee" service.

Name (Print)

Signature

Jc796 U.S. PTO
09/653181
08/31/00

PLEASE CHARGE ANY DEFICIENCY UP TO \$300.00 OR
CREDIT ANY EXCESS IN THE FEES DUE WITH THIS
DOCUMENT TO OUR DEPOSIT ACCOUNT NO. 04-0100

DARBY & DARBY P.C.

805 Third Avenue
New York, New York 10022
212-527-7700

Docket No: **6727/0H608**

Box PATENT APPLICATION
Assistant Commissioner for Patents
Washington, DC 20231

Sir:

Enclosed please find an application for United States patent as identified below:

Inventor/s (name ALL inventors):

Simona COHEN

Title: **FACSIMILE TRANSMISSION OVER PACKET NETWORKS WITH DELIVERY NOTIFICATION**

including the items indicated:

1. Specification and 40 claims: 6 indep.; 34 dep.; 0 multiple dep.
2. ☒ Executed declaration and power of attorney
☐ Unexecuted declaration and power of attorney
3. ☒ Formal drawings, 6 sheets (Figs. 1-6)
☐ Informal drawings, sheets (Figs.)

09653181-000100

4. ☒ Assignment for recording to: INTERNATIONAL BUSINESS
MACHINES CORPORATION
5. ☐ Verified Statement Claiming Small Entity Status
6. ☒ Check in amount of \$1,324.00, (\$1,284.00) filing; \$40.00
recording)
(See attached **Fee Computation Sheet**)
7. ☒ Associate Power of Attorney to Manny Schechter.
8. ☒ Information Disclosure Statement.

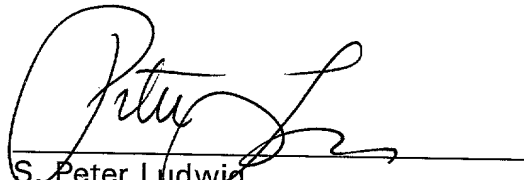
Priority is claimed for this application, corresponding application/s having been
filed as follows:

Country: NONE
Number:
Date:

The priority documents ☐ are enclosed
☐ will follow.

Respectfully submitted,

Dated: August 31, 2000


S. Peter Ludwig
Reg. No. 25,351
Attorney for Applicant(s)

DARBY & DARBY P.C.
805 Third Avenue
New York, New York 10022
212-527-7700

Serial No. To Be Assigned

Docket No. 6727/OH612

PATENT FEE COMPUTATION SHEET

	No. of Claims Presented	Extra Claims Previously Paid For	Number of Extra Claims	Rate
Basic Fee				\$690.00
Total Claims	40 - 20	0	20 x \$18.00	\$360.00
Independent Claims	6 - 3	0	3 x \$78.00	\$234.00
Multiple Dependent Claims		- if so, add	\$260.00	\$0.00
Surcharge for late submission of filing fee and/or declaration (\$130.00)				\$0.00
SUBTOTAL				\$1,284.00
<input type="checkbox"/> Small Entity REDUCTION (Half of Subtotal)				\$0.00
Fee for recordation of assignment (\$40.00)				\$40.00
Charge for filing non-English language application (\$130.00)				\$0.00
TOTAL				\$1,324.00

FACSIMILE TRANSMISSION OVER PACKET NETWORKS WITH DELIVERY
NOTIFICATION

FIELD OF THE INVENTION

The present invention relates generally to
5 communication systems, and specifically to systems and
methods for facsimile transmission over packet networks.

BACKGROUND OF THE INVENTION

Facsimile transmissions (fax) are conventionally
carried over circuits of the public switched telephone
10 network (PSTN), in accordance with the T.30 protocol
standardized by the International Telecommunications
Union (ITU-T), which is incorporated herein by reference.
Because of the high volume and high cost of sending faxes
over the PSTN, there is increasing demand for fax
15 services over packet networks, including fax over
Internet Protocol (FoIP), frame relay and Asynchronous
Transfer Mode (ATM) networks. A number of companies now
offer services and equipment for fax transmission over
packet networks, for example, Telogy Networks
20 (www.telogy.com) and Miltel Telecommunication
(www.milcoms.com).

Fig. 1 is a message flow diagram that schematically
illustrates the essential elements of the T.30 protocol.
The protocol is divided into five phases:

- 25 A. Call establishment - The sending fax terminal
sends a calling tone (CNG), and the receiving fax
terminal answers with a called terminal
identification (CED).
- 30 B. Control and capabilities exchange - In this stage,
the two terminals identify their capabilities and
negotiate the conditions (such as data rate) of the

IL9-2000-0026

1

EXPRESS MAIL CERTIFICATE

Date

8/31/00

Label No.

62628222539

I hereby certify that, on the date indicated above I
deposited this paper or fee with the U.S. Postal Service
& that it was addressed for delivery to the Commissioner
of Patents & Trademarks, Washington D.C. 20231 by
"Express Mail Post Office to Addressee" service.

Name (Print)

Signature

call. The receiving terminal first sends a digital identification signal (DIS). The sending terminal responds with a digital command signal, defining the conditions of the call. It then initiates a training session with a training check field (TCF), to verify that the channel linking the calling and receiving terminals can carry the fax data at the intended data rate. The receiving terminal responds with a confirmation to receive (CFR) or a failure to train (FTT). In the case of an FTT, the training is repeated if possible, or else the call is terminated.

C. Page transfer - The sending terminal transmits a page of fax image data.

D. End of page and multi-page signaling - At the end of each page, the sending terminal sends a multi-page signal (MPS) if it has additional pages waiting to be sent, or an end of procedure (EOP) signal if there are no further pages. The receiving terminal responds with a message confirmation (MCF) to indicate that it received the page successfully and is ready to receive additional pages. Otherwise, the receiving terminal may send a retrain positive (RTP) or retrain negative (RTN) to indicate that retraining is needed before transmission can continue.

E. Call release - After receiving the last MCF from the receiving terminal, the sending terminal sends a disconnect (DCN) signal to the receiving terminal, and the call is concluded.

Disconnection may also occur when training or retraining is unsuccessful or when there is a timeout due to one of

5

10

- 30

5

10

25

5

SUMMARY OF THE INVENTION

10

30

before disconnecting, even when a real-time fax connection cannot be maintained due to network constraints.

The present invention thus offers a novel solution to the inadequacy of the real-time packet fax protocol (T.38) in the face of long and unpredictable packet delays, which commonly occur in congested networks. While deviating from the T.38 standard, preferred embodiments of the present invention still maintain full compatibility with existing T.30 fax terminals. These preferred embodiments are particularly suited to fax over IP network applications, but can also be adapted for use in fax transmission over packet networks of other types, such as ATM and frame relay networks.

15 In preferred embodiments of the present invention,
gateways with session fax capability, as described above,
are linked to either or both of the sending terminal and
the receiving terminal. After establishing the call, the
gateway at the receiving side awaits pages of fax data
20 from the sending terminal. When a page does not arrive
in time to prevent a timeout by the receiving terminal,
the gateway sends one or more fill pages. Once all of
the actual fax data for the page have finally arrived,
the gateway sends the complete page to the receiving
25 terminal.

The gateway at the sending side gives the sending terminal a confirmation of receipt of each page, without necessarily waiting for an actual confirmation message from the receiving terminal. After the sending terminal has sent the last of the pages, the gateway awaits the last of the actual confirmation messages from the sending terminal. If the last confirmation message does not

5

10

15

20

and

25

30

5

10

20

30

5

10

15

20

25

30

conveying the second page of the facsimile data over
5 the packet network to the receiving terminal;

responsive to the first and second confirmation packets, sending a notification from the gateway to the sending terminal before terminating the facsimile call that the pages were delivered to the receiving terminal.

There is further provided, in accordance with a preferred embodiment of the present invention, apparatus for facsimile transmission over a packet network, including a computer gateway, in communication with the packet network and configured to establish a facsimile call between first and second facsimile terminals in accordance with a facsimile protocol and to convey

5
10

15
20
25
30

There is furthermore provided, in accordance with a preferred embodiment of the present invention, a computer software product for facsimile transmission over a packet network, including a computer-readable medium in which program instructions are stored, which instructions, when read by a facsimile gateway computer in communication with the packet network, cause the computer to establish a facsimile call between first and second facsimile terminals in accordance with a facsimile protocol and to convey communications between the terminals over the packet network, to await arrival of a signal conveyed over the packet network from the first terminal to be transmitted from the computer to the second terminal as provided by the protocol, to transmit a fill page to the second terminal if the signal does not arrive within a time limit determined in accordance with the protocol, and upon receiving the signal, to transmit the signal to the second terminal after transmitting the fill page.

25 software product for facsimile transmission over a packet
network, including a computer-readable medium in which
program instructions are stored, which instructions, when
read by a facsimile gateway computer in communication
with the packet network, cause the computer to establish
30 a facsimile call with a sending terminal, to receive a
first page of facsimile data from the sending terminal,
to convey the first page of the facsimile data over the

packet network to a receiving terminal, and to transmit a confirmation signal to the sending terminal after receiving the first page without having waited to receive a first confirmation packet over the network indicating
5 that the first page was received at the receiving terminal, and further cause the computer to receive a second page of facsimile data from the sending terminal responsive to transmitting the confirmation signal, and to convey the second page of the facsimile data over the
10 packet network to the receiving terminal, and still further cause the computer to await arrival over the network of the first confirmation packet and of a second confirmation packet indicating that the second page was received at the receiving terminal, and responsive to the
15 first and second confirmation packets, to send a notification to the sending terminal before terminating the facsimile call that the pages were delivered to the receiving terminal.

The present invention will be more fully understood
20 from the following detailed description of the preferred embodiments thereof, taken together with the drawings in which:

Fig. 1 is a message flow diagram that schematically illustrates elements of the T.30 fax protocol, as is known in the art;

Fig. 3 is a flow chart that schematically
10 illustrates a method for sending a fax over a packet
network, in accordance with a preferred embodiment of the
present invention;

Fig. 5 is a flow chart that schematically illustrates a method for receiving a fax over a packet network, in accordance with a preferred embodiment of the present invention; and

IL9-2000-0026

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Fig. 2 is a schematic, pictorial illustration of a system 20 for fax transmission over a packet network 28, in accordance with a preferred embodiment of the present invention. Typically, network 28 comprises an IP network, as shown in the figure, although the principles of the present invention are also applicable to fax transmission over packet networks of other types. System 20 enables a sending fax terminal 22 to communicate over network 28 with a receiving fax terminal 32. Terminals 22 and 32 typically comprise standard T.30 fax machines. Alternatively, terminal 22 and/or 32 may comprise substantially any T.30-compatible device, such as a computer with a suitable fax modem, or a mobile telephone with fax capability. The system also enables terminals 22 and 32 to communicate with an Internet-compatible fax machine 34, such as a fax machine having an integral adapter for T.38 operation.

Terminals 22 and 32 communicate over network 28 by means of respective fax gateways 24 and 30. Connection between the terminals and the respective gateways is typically made via a circuit-switched network 26, such as a PSTN, as is known in the art. Alternatively, the connection may be made by a point-to-point line or private exchange. As described in detail hereinbelow, gateways 24 and 30 are configured for real-time fax communications, preferably in accordance with the T.38 protocol, and automatically switch to a session fax mode in response to network packet delays. Typically, gateways 24 and 30 comprise general-purpose computers having suitable modems for communicating with terminals 22 and 32 and network interfaces for communicating over

network 28. The gateways preferably carry out their fax communications under the control of suitable software, which may be downloaded to the gateways in electronic form or furnished on tangible media, such as CD-ROM or
5 non-volatile memory.

Fig. 3 is a flow chart that schematically illustrates a method of communications between sending terminal 22 and gateway 24, in accordance with a preferred embodiment of the present invention. At a call
10 establishment step 40, terminal 22 places a fax call to terminal 32. The call is preferably routed automatically to gateway 24, as described, for example, in the above-mentioned U.S. Patent 5,828,468. Alternatively, terminal 22 may place the fax call to gateway 24, with
15 further instructions requesting that the call be routed to terminal 32. In either case, gateway 24 signals gateway 30 via network 28, and gateway 30 establishes the call with terminal 32. Following the CNG and CED signals (shown in Fig. 1), gateway 30 receives a DIS from
20 terminal 32 and passes it (in packetized form) to gateway 24 for delivery to terminal 22. Terminal 22 sends the DCS, training and TCF signals to gateway 24. (These and some other standard signals are omitted from the figures for the sake of simplicity.) The gateway replies with a
25 CFR or FTT signal, depending on the quality of the connection between gateway 24 and terminal 22, at a training conclusion step 42.

With the training complete, terminal 22 begins sending data to gateway 24, at a data transmission step
30 44. Gateway 24 packetizes the data and transmits the packets over network 28 to gateway 30. At the conclusion of each page, in accordance with the T.30 standard,

terminal 22 sends either a MPS, indicating that additional pages are yet to come, or an EOP signal (not shown in the figure). Gateway 24 receives the MPS or EOP signal, and thus determines whether or not the current page is the last one, at a page decision step 46. If the current page was not the last one, gateway 24 returns to terminal 22 a MCF if it received the page satisfactorily, or a RTP/RTN signal if not, at a confirmation step 48. The gateway sends this message without waiting for a confirmation or other signal from terminal 32 (via gateway 30). This mode of communication enables terminal 22 to continue transmission without timing out, even when there are delays on network 28 between gateways 24 and 30. Meanwhile, gateway 24 notes the confirmation signals that it receives from gateway 30 in order to track the number of pages that terminal 32 has actually received. Terminal 22 continues sending additional pages at step 44 until the last page has been reached.

Once the last page has been received, followed by an EOP signal from terminal 22, gateway 24 checks to determine whether gateway 30 has sent back a notification that the last of the pages has been delivered to receiving terminal 32, at a notification checking step 50. If the delays in network 28 are minimal, this notification will be received within the time limit prescribed by the T.30 and T.38 standards. In this case, gateway 24 immediately sends the delivery notification to terminal 22 in response to the last fax page in the form of a MCF (or RTP/RTN), at a delivery notification step 56.

If the delivery notification at step 50 is not received in time, however, gateway 24 initiates a line

turnaround, at a turnaround step 52. Line turnaround is a function provided by the T.30 standard to enable services such as polling, whereby a first fax machine initiates a call to a second one, after which the second fax machine transmits pages back to the first one. Server 24 uses this function in a novel way to prevent terminal 22 from timing out. Following the turnaround, gateway 24 sends one or more fill pages to terminal 22, at a page delay step 54. Preferably, the fill pages carry a message to an operator of terminal 22, such as "Delivery confirmation delayed due to network lag," for example. When gateway 24 finally receives the delivery notification from gateway 30, it sends the delivery notification (or a notification that delivery was unsuccessful) to terminal 22, at step 56.

Fig. 4 is a message flow diagram showing details of turnaround step 52, in accordance with a preferred embodiment of the present invention. After receiving the EOP from terminal 22 at step 46, and failing to receive delivery notification in time, gateway 24 sends a RTN signal to terminal 22. In response to the RTN, terminal 22 returns to phase B, in accordance with the T.30 protocol, and sends DCS, training and TCF signals to gateway 24. The gateway then initiates the turnaround with a digital transmit command (DTC) to the terminal, which is the signal provided by T.30 for initiating line turnaround.

Sending the DTC at this point is a violation of the conventional T.30 protocol on the part of gateway 24. Because DTC is itself a standard message, however, an ordinary T.30 fax machine, such as terminal 22, will still have no problem in responding to it. Terminal 22

5

10

25

5

10

25

24, and sends a DCN signal to terminal 32, terminating the call, at a final step 84.

Fig. 6 is a flow chart that schematically illustrates details of interim retraining step 64, in accordance with a preferred embodiment of the present invention. As noted above, this step is invoked when gateway 30 fails to receive a DCS packet from gateway 24 in time to train terminal 32 accordingly. Instead, at a default DCS step 90, gateway 30 sends its own, default DCS to terminal 32, followed by training and TCF signals. If necessary, it then sends the terminal one or more fill pages, at a fill step 92, while waiting for the DCS packet to arrive.

When the DCS packet does finally arrive from gateway 24, at a DCS reception step 94, gateway 30 determines whether the sender capabilities indicated by this "real" DCS match the default capabilities negotiated with terminal 32, at a capabilities checking step 96. If there is a discrepancy in the capabilities, gateway 30 initiates a new capabilities exchange and training phase with terminal 32. In order to invoke this exchange, at an error page step 98, gateway 30 sends terminal 32 a fill page in which it has deliberately created errors. The errors cause terminal 32 to return a RTN signal to gateway 30, at a retraining initiation step 100. Gateway 30 responds by sending new DCS, training and TCF signals, at a new DCS step 102. At this step, the capabilities are set to match the capabilities reported in the DCS packet from gateway 24, instead of the default capabilities negotiated previously. The retraining is completed upon receipt of a CFR signal from terminal 32, at a CFR step 104. At this point, gateway 30 proceeds to

CLAIMS

1 1. A method for facsimile transmission over a packet
2 network, comprising:
3 establishing a facsimile call between first and
4 second facsimile terminals in accordance with a facsimile
5 protocol, using a facsimile gateway to convey
6 communications between the terminals over the packet
7 network;
8 awaiting arrival at the gateway of a signal conveyed
9 over the packet network from the first terminal, to be
10 transmitted from the gateway to the second terminal as
11 provided by the protocol;
12 transmitting a fill page from the gateway to the
13 second terminal if the signal does not arrive within a
14 time limit determined in accordance with the protocol;
15 and
16 receiving the signal at the gateway and transmitting
17 the signal from the gateway to the second terminal after
18 transmitting the fill page.

1 2. A method according to claim 1, wherein the facsimile
2 protocol comprises a T.30 protocol of the International
3 Telecommunications Union (ITU-T).

1 3. A method according to claim 2, wherein the packet
2 network operates in accordance with an Internet Protocol
3 (IP).

1 4. A method according to claim 3, wherein establishing
2 the facsimile call comprises establishing a real-time fax
3 over IP connection, and wherein transmitting the fill
4 page comprises initiating a session fax mode of
5 communication in response to a network delay causing the
6 signal to fail to arrive within the time limit.

1 10. A method according to claim 9, wherein transmitting
2 the fill page comprises instructing the sending terminal
3 to perform a line turnaround in order to receive the fill
4 page.

1 12. A method for facsimile transmission over a packet
2 network, comprising:

```
6         receiving a first page of facsimile data from the
7         sending terminal at the gateway;
```

11 transmitting a confirmation signal from the gateway
12 to the sending terminal after receiving the first page at
13 the gateway, without having waited to receive a first

14 confirmation packet over the network indicating that the
15 first page was received at the receiving terminal;
16 responsive to transmitting the confirmation signal,
17 receiving a second page of facsimile data from the
18 sending terminal;
19 conveying the second page of the facsimile data over
20 the packet network to the receiving terminal;
21 awaiting arrival at the gateway of the first
22 confirmation packet and of a second confirmation packet
23 over the network indicating that the second page was
24 received at the receiving terminal; and
25 responsive to the first and second confirmation
26 packets, sending a notification from the gateway to the
27 sending terminal before terminating the facsimile call
28 that the pages were delivered to the receiving terminal.

1 13. A method according to claim 12, wherein establishing
2 the facsimile call comprises establishing the call in
3 accordance with a T.30 protocol of the International
4 Telecommunications Union (ITU-T).

1 14. A method according to claim 13, wherein the packet
2 network operates in accordance with an Internet Protocol
3 (IP).

1 15. A method according to claim 14, wherein establishing
2 the facsimile call comprises initiating a real-time fax
3 over IP connection, and wherein sending the notification
4 comprises completing the call in a session fax mode.

1 16. A method according to claim 15, wherein initiating
2 the real-time fax over IP connection comprises
3 establishing the connection in accordance with an ITU-T
4 T.38 protocol.

1 32. Apparatus according to claim 31, wherein the gateway
2 is adapted to establish the facsimile call in accordance
3 with a T.30 protocol of the International
4 Telecommunications Union (ITU-T).

1 34. Apparatus according to claim 33, wherein the gateway
2 is adapted to establish the facsimile call as a real-time
3 fax over IP connection, and to complete the call by
4 sending the notification in a session fax mode.

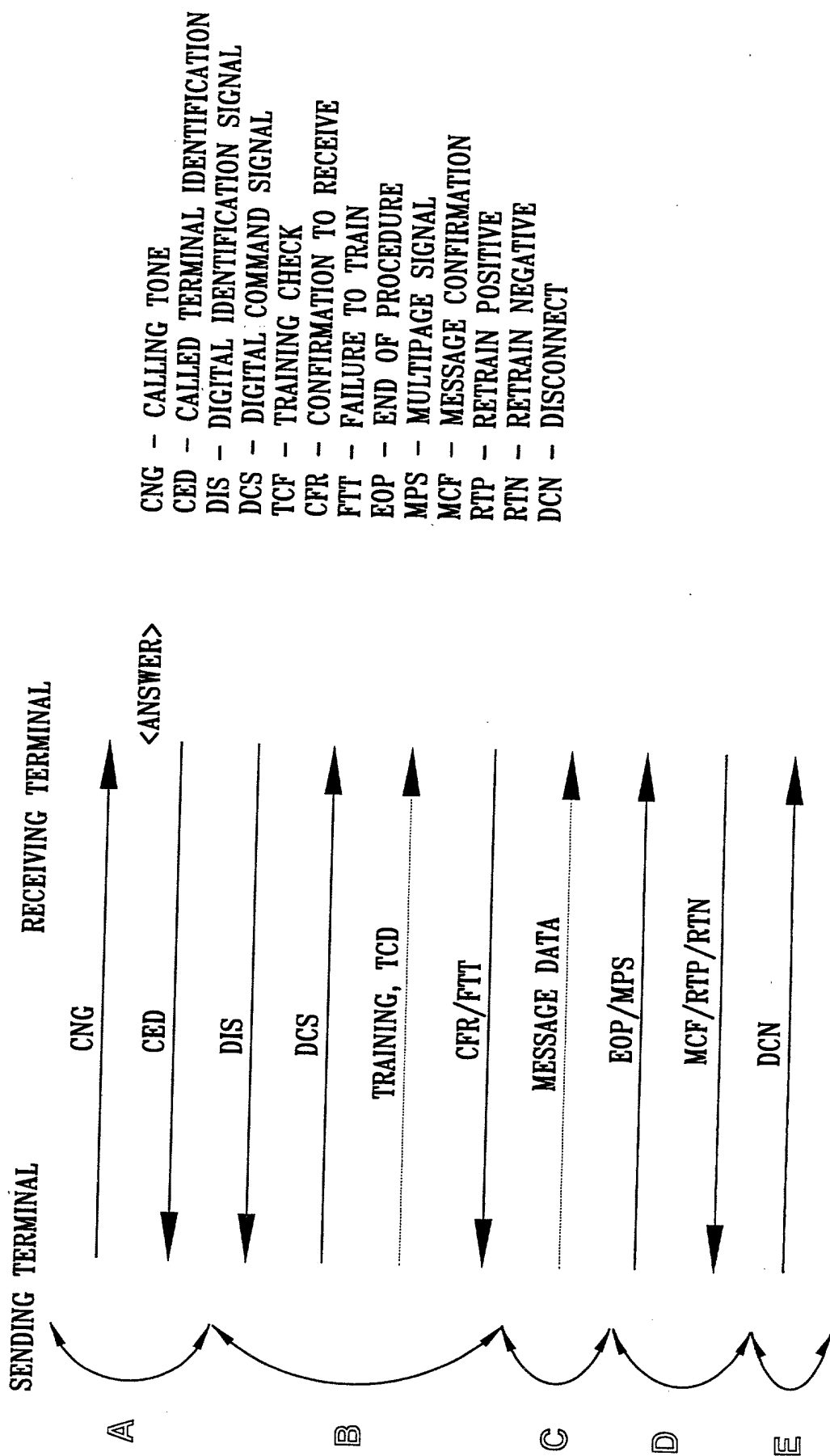
1 39. A computer software product for facsimile
2 transmission over a packet network, comprising a
3 computer-readable medium in which program instructions
4 are stored, which instructions, when read by a facsimile
5 gateway computer in communication with the packet
6 network, cause the computer to establish a facsimile call
7 between first and second facsimile terminals in
8 accordance with a facsimile protocol and to convey
9 communications between the terminals over the packet
10 network, to await arrival of a signal conveyed over the
11 packet network from the first terminal to be transmitted
12 from the computer to the second terminal as provided by
13 the protocol, to transmit a fill page to the second
14 terminal if the signal does not arrive within a time

1 40. A computer software product for facsimile
2 transmission over a packet network, comprising a
3 computer-readable medium in which program instructions
4 are stored, which instructions, when read by a facsimile
5 gateway computer in communication with the packet
6 network, cause the computer to establish a facsimile call
7 with a sending terminal, to receive a first page of
8 facsimile data from the sending terminal, to convey the
9 first page of the facsimile data over the packet network
10 to a receiving terminal, and to transmit a confirmation
11 signal to the sending terminal after receiving the first
12 page without having waited to receive a first
13 confirmation packet over the network indicating that the
14 first page was received at the receiving terminal, and
15 further cause the computer to receive a second page of
16 facsimile data from the sending terminal responsive to
17 transmitting the confirmation signal, and to convey the
18 second page of the facsimile data over the packet network
19 to the receiving terminal, and still further cause the
20 computer to await arrival over the network of the first
21 confirmation packet and of a second confirmation packet
22 indicating that the second page was received at the
23 receiving terminal, and responsive to the first and
24 second confirmation packets, to send a notification to
25 the sending terminal before terminating the facsimile
26 call that the pages were delivered to the receiving
27 terminal.

NOTIFICATION

A method for facsimile transmission over a packet network includes establishing a facsimile call between first and second facsimile terminals in accordance with a facsimile protocol, using a facsimile gateway to convey communications between the terminals over the packet network. The gateway awaits the arrival of a signal conveyed over the packet network from the first terminal, to be transmitted from the gateway to the second terminal as provided by the protocol, and it transmits a fill page to the second terminal if the signal does not arrive within a time limit determined in accordance with the protocol. Upon receiving the signal, the gateway transmits the signal to the second terminal after transmitting the fill page.

FIG. 1
(PRIOR ART)



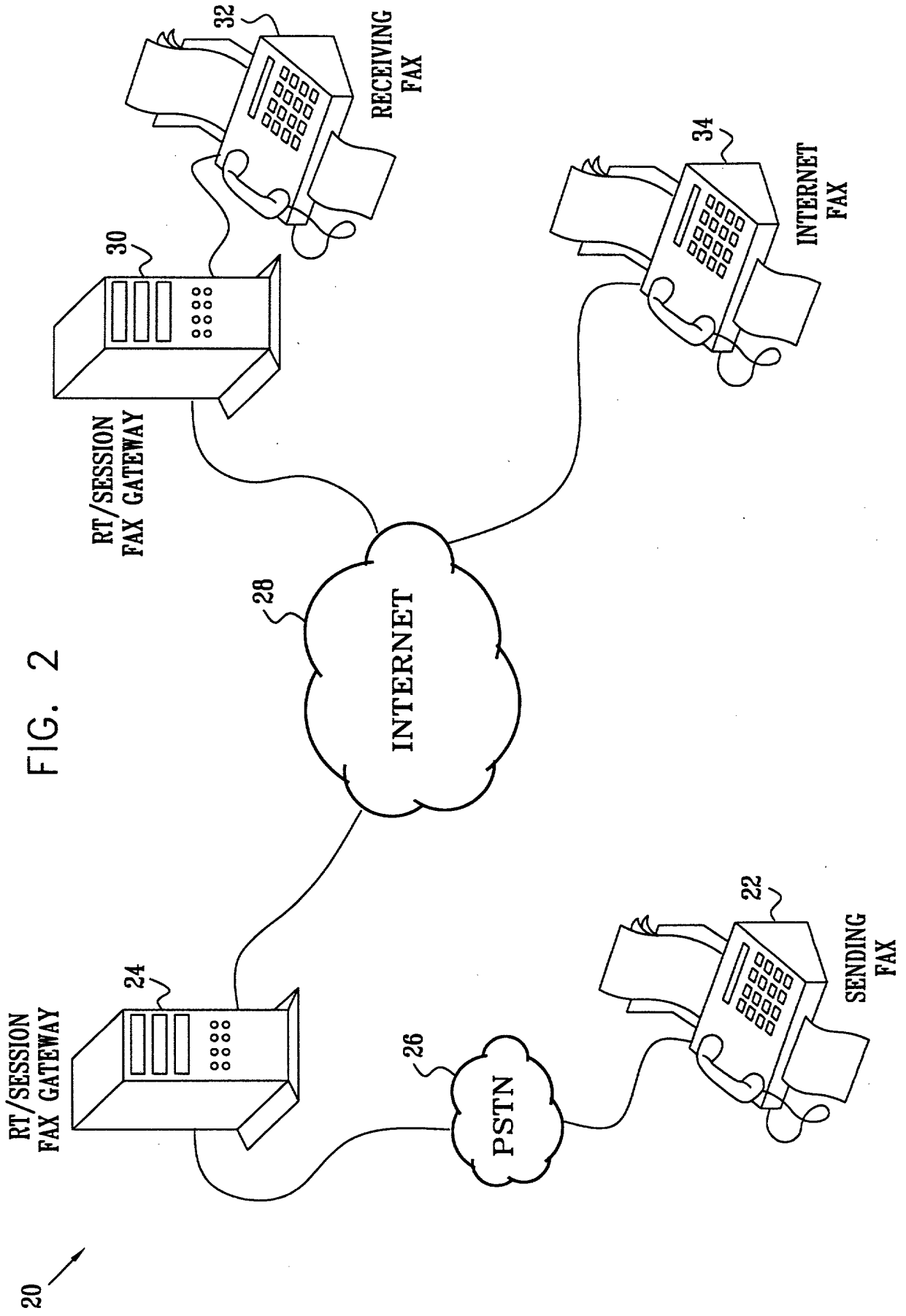
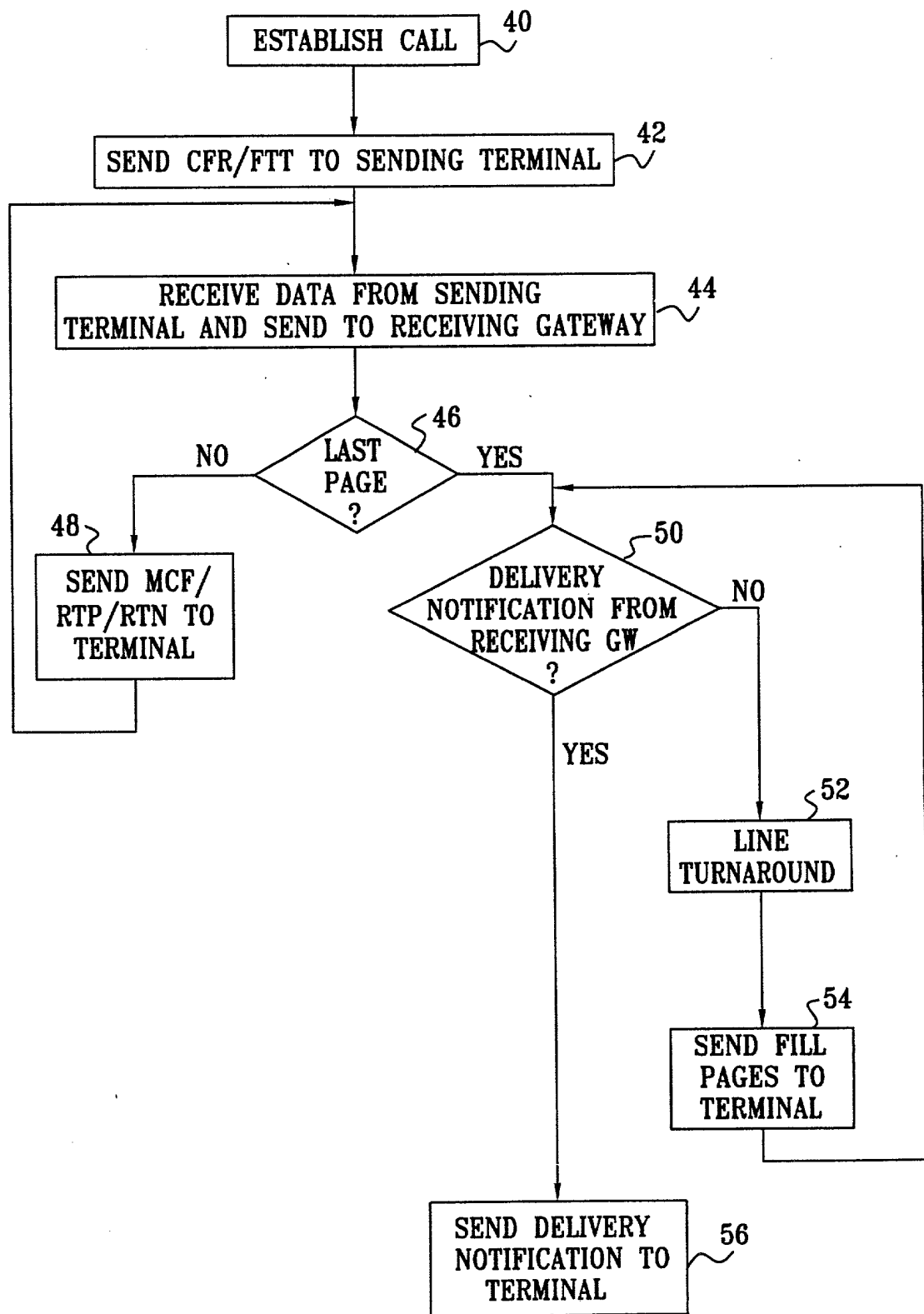
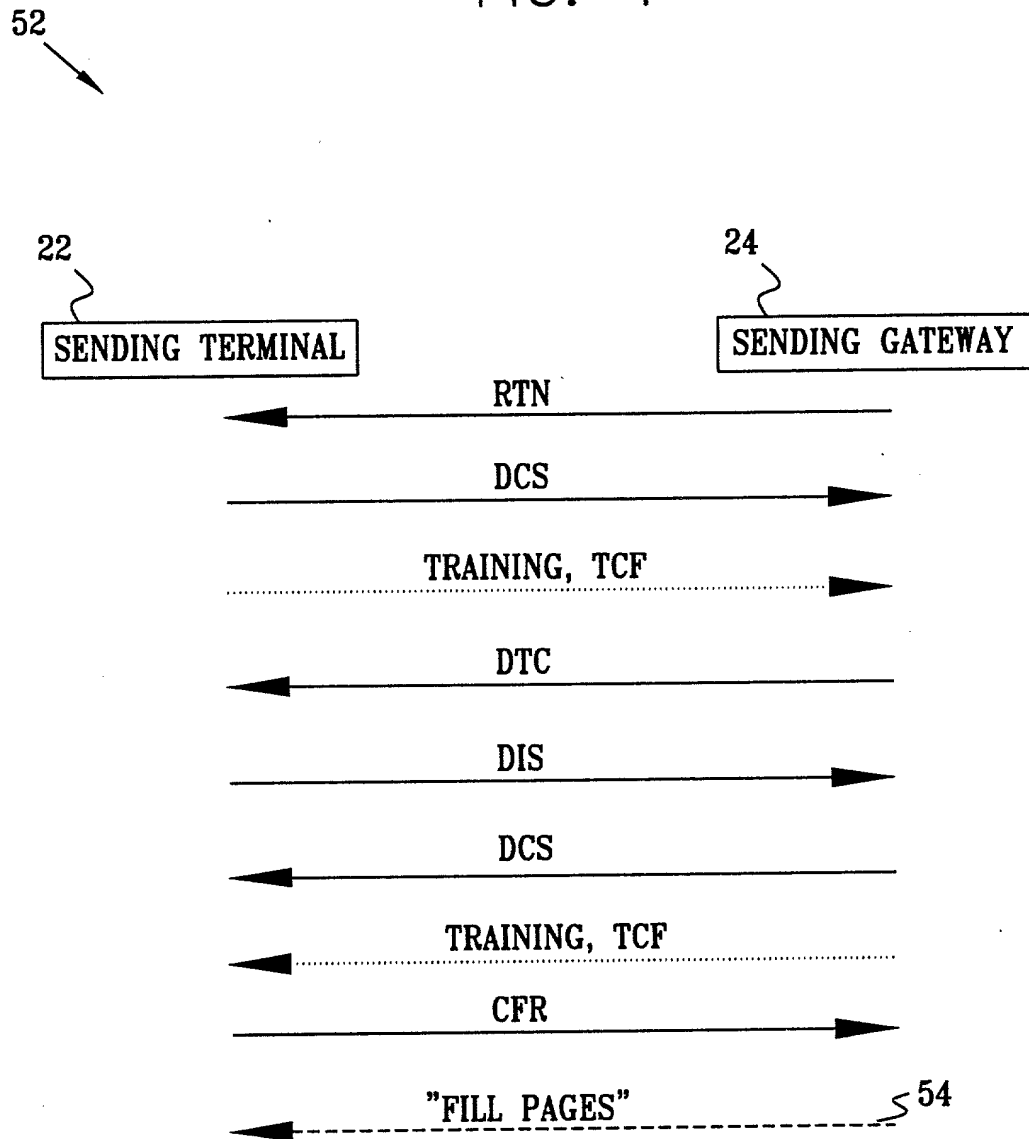


FIG. 3



095541.02100
007220" T8T55350

FIG. 4



ESTABLISH CALL

60

FIG. 5

DCS
RECEIVED
FROM SENDING
GW ?

62

YES

NO

66

SEND DCS,
TRAINING, TCF
TO TERMINAL

64

INTERIM
TRAINING
PROCEDURE

DATA
RECEIVED
FROM SENDING
GW ?

70

NO

YES

SEND FILL
PAGE, MPS
TO TERMINAL

72

SEND DATA
TO TERMINAL

74

MPS/EOP
RECEIVED
FROM SENDING
GW ?

76

NO

YES

SEND MPS,
FILL PAGE
TO TERMINAL

78

NO

80

EOP

YES

SEND MPS
TO TERMINAL

81

82

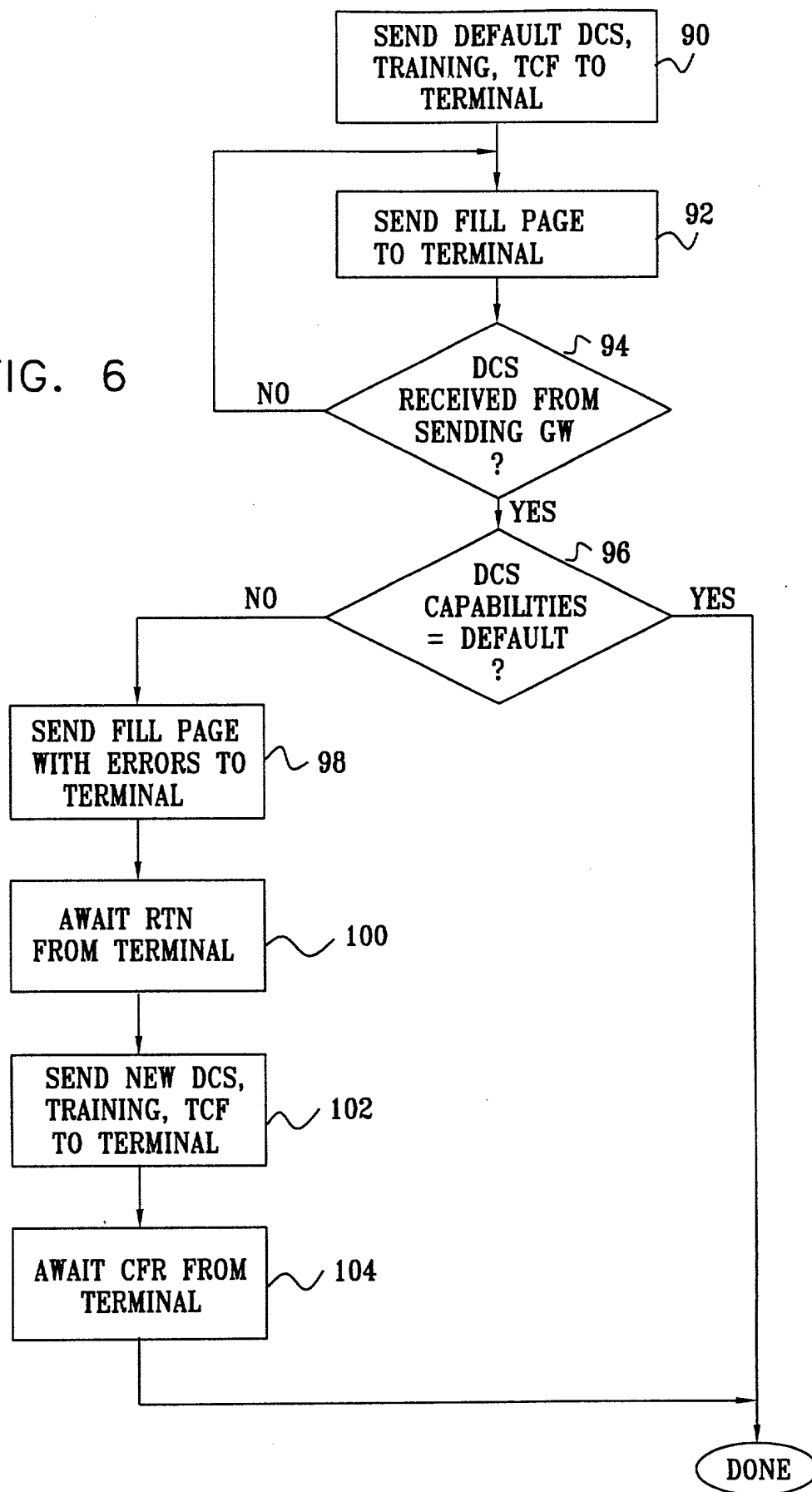
SEND EOP
TO TERMINAL

84

DCN

09053181 069100

FIG. 6



**DECLARATION
AND POWER OF ATTORNEY
Original Application**

ATTORNEY'S DOCKET NO. (IF A

As a below named inventor, I declare that the information given herein is true, that I believe that I am the original, first and sole inventor if only name is listed at 201 below, or a joint inventor if plural inventors are named below at 201-203, of the invention entitled:

FACSIMILE TRANSMISSION OVER PACKET NETWORKS WITH DELIVERY NOTIFICATION

which is described and claimed in:

☒ the attached specification or ☐ the specification in application Serial No. _____ filed _____
(for declaration not accompanying application)

I do not know and do not believe that the same was ever known or used in the United States of America before my or our invention thereof or patented described in any printed publication in any country before my or our invention thereof, or more than one year prior to this application, or in public use or on sale in the United States of America more than one year prior to this application, that the invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to this application, that I acknowledge my duty to disclose information of which I am aware which is material to the examination of this application in accordance with 37 CFR 1.56(a), and that no application for patent or inventor's certificate on this invention has been filed by me or my legal representatives or assigns in any country foreign to the United States of America except as identified below. I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

FOREIGN APPLICATION(S), IF ANY, FILED WITHIN 12 MONTHS PRIOR TO THE FILING DATE OF THIS APPLICATION

COUNTRY	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 U.S.C. 119
			YES ___ NO ___
			YES ___ NO ___

ALL FOREIGN APPLICATIONS, IF ANY, FILED MORE THAN 12 MONTHS PRIOR TO THE FILING DATE OF THIS APPLICATION

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: Morris Nelson #15,108, Gordon D. Coplein #19,165, William F. Dudine, #20,569, Michael J. Sweedler #19,937, S. Peter Ludwig #25,351, Paul Fields #20,298, Joseph B. Lerch #26,936, Melvin C. Garner #26,272, Ethan Horwitz #27,646, Beverly B. Goodwin #28,417, Adda C. Gogoris #29,714, Martin E. Goldstein #20,869, all of the firm of Darby & Darby P.C., 805 Third Avenue, New York, New York 10022

SEND CORRESPONDENCE TO	DIRECT TELEPHONE CALLS TO:
DARBY & DARBY P.C. 805 Third Avenue New York, New York 10022	(212) 697-7660

201	FULL NAME OF INVENTOR	LAST NAME Cohen	FIRST NAME Simona	MIDDLE NAME
	RESIDENCE & CITIZENSHIP	CITY Haifa	STATE OR FOREIGN COUNTRY Israel	COUNTRY OF CITIZENSHIP Israel
	POST OFFICE ADDRESS	POST OFFICE ADDRESS 23 Shimkin Street	CITY Haifa	STATE OR COUNTRY Israel
202	FULL NAME OF INVENTOR	LAST NAME	FIRST NAME	MIDDLE NAME
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE OR COUNTRY
203	FULL NAME OF INVENTOR	LAST NAME	FIRST NAME	MIDDLE NAME
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE OR COUNTRY

☐ Additional matter on page 2 (Form PTO-1298). (When page 2 is used, all signatures should be placed on page 2.)

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 201 X 100 JIN'O	SIGNATURE OF INVENTOR 202	SIGNATURE OF INVENTOR 203
DATE X 15/8/2000	DATE	DATE

EXPRESS MAIL CERTIFICATE

8/31/00 628222539

I hereby certify that, on the date indicated above I
deposited this paper or fee with the U.S. Postal Service
& that it was addressed for delivery to the Commissioner
of Patents & Trademarks, Washington D.C. 20231 by
"Express Mail Post Office to Addressee" service.

File No.: 6727/OH608

Name (Print)

Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICEIn Re Application of: **Simona COHEN**

Serial No: To Be Assigned

Examiner: To Be Assigned

Filed: CONCURRENT

Group Art Unit: To Be Assigned

For: **FACSIMILE TRANSMISSION OVER PACKET NETWORKS
WITH DELIVERY NOTIFICATION**

ASSOCIATE POWER OF ATTORNEY

Hon. Commissioner of
Patents and Trademarks
Washington, DC 20231

Sir:

The undersigned attorney of record in the above-identified application
hereby appoints: Manny Schechter, Esq. (Reg. No. 31,722) located at c/o
International Business Machines Corporation, New Orchard Road, Armonk, New
York, N.Y. 10504, U.S.A., as associate attorney with full power to prosecute said
application, and to transact all business in the United States Patent and Trademark
Office in connection therewith.



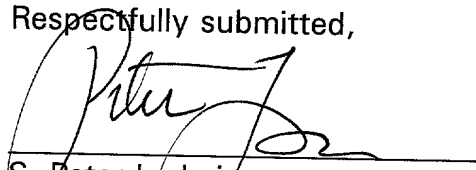
007639-10763900

Please forward all communications to:

S. Peter Ludwig
Darby & Darby P.C.
805 Third Avenue
New York, New York 10022

Dated: August 31, 2000

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "Peter Ludwig", is written over a horizontal line.

S. Peter Ludwig
Reg. No. 25,351
Attorney for Applicant(s)

DARBY & DARBY P.C.
805 Third Avenue
New York, NY 10022
212-527-7700

007533-1875550